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U.S. Department of Energy
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Chairman Frelinghuysen, Mr. Pastor, Mr. Simpson, thanks for the opportunity on what I know is a very busy day to provide an overview of the President's Fiscal Year 2012 budget request for the Department of Energy's Office of Science.

We face great national and global challenges over the next several decades. Foremost among them are providing clean and reliable energy at affordable prices, maintaining the United States' competitiveness in a global economy through innovation and job creation, and enhancing nuclear security.

Science and technology are central to the President's strategy for addressing these challenges. The President's Budget Request for Fiscal Year 2012 makes tough choices while focusing resources on innovation. For the Department's FY12 request, we aim to invest in science with the greatest timeliness, relevance, and impact, respecting the need to maximize the impact of every federal dollar that we are allocated. The Office of Science plays a unique role in the Nation's science and technology enterprise, not only through the mission-oriented research we support, but also through the suite of scientific user facilities we design, construct, and operate.

The $5.416 billion request for the Office of Science is an increase of $512 million or 10.4 percent over the FY 2010 appropriation. That amount realizes the President's commitment to continue on a path that doubles funding for the Office of Science and other key basic research

agencies, a journey that began with President Bush in his American Competitiveness Initiative. Congress authorized $5.614 billion for the Office of Science in FY 2012 through the America COMPETES Reauthorization Act of 2010 passed in the last session. The request before you is in line with that authorization.

Our FY 2012 request reflects a very clear and deliberate strategy to support those areas of science with the most direct impact on the energy, security, and environment missions of the Department - materials, biology, and computation. Let me explain briefly why we are focused on those fields.

Materials make up everything in our world - from those in the chips in your cell phone, to those that can withstand high temperatures in a power plant, to those in batteries for hybrid vehicles. What is so exciting now is that new tools are letting us understand and control what atoms are doing inside materials to more rapidly discover or create better materials. Nanoscience lets us create stuff almost atom-by-atom, our light sources and neutron sources let us see what those atoms are doing, and high-performance computer models let us predict the properties that result.

The US is not alone in trying to accelerate the process of "make, measure, model" for materials. In 1980, there were only 10 synchrotron light sources worldwide. Today, there are more than 50—most of them are outside of the US and more are under construction.

The situation in biology is not much different - while there are millions of microbes in the world, greatest attention has been paid to the small fraction that are medically relevant. But the vast majority do amazing non-medical things: concentrate waste, turn sunlight into fuel, capture CO_2, produce H_2, and live in places we never believed possible. Understanding how the microbes can do that, and harnessing those capabilities for practical application, is a focus of

DOE efforts. Toward those ends, we develop and field tools like high-throughput sequencing, gene chips, light sources, and computer tools that are broadly useful in biology. The President's Budget knits together all of those strands into a systems biology effort.

Finally, you may have noticed that both the materials and biology efforts involve hig performance computing. Growing and utilizing our capabilities in that field is the third major focus of the budget proposal. Through major programs in NNSA and Office of Science over the past several decades, the DOE leads the world in using computers to understand complex systems, ranging from nuclear weapons to proteins to climate. We see great potential in applying that expertise to address many important energy issues, optimizing designs and shortening the time it takes for a new technology to go from the lab to full-scale implementation.

The Department makes available to a broad range of users the world's second most powerful computer. We were surpassed last November by a Chinese machine almost twice as fast as our fastest. We believe it's very important for the U.S. to maintain global leadership in High Performance Computing, and this budget request puts us on a path to not only reclaim the top spot in a year or so, but to drive through a 1,000-fold improvement during the next decade.

Clear priorities mean tough choices for fields such as high energy physics, my own field of nuclear physics, and fusion energy. The Office of Science supports nearly 90 percent of U. S. research in elementary particle physics, yet we acknowledge this budget climate forces us to make tough choices through flat funding in that area. The Office of Science supports nearly 80 percent of U. S. basic nuclear physics research, yet we are proposing to redirect resources from operating current facilities to constructing the next generation of world-class facilities.

Finally, I'd like to discuss briefly the performance of the Office of Science. Metrics for basic research are difficult – but not impossible – to develop. The easiest things to quantify are

the performance of our construction projects and our facilities operations. Over the past five years, the Office of Science successfully completed 23 of 25 construction projects within scope, cost, and schedule targets. Those projects would have cost a total of $3.11 billion, and we delivered them for $3.22 billion – a difference of less than 5%. Of the three projects that overran on cost or schedule, we cancelled one – the National Compact Stellarator Experiment – when it became clear that it couldn't be delivered and before actual spending got out of control. In FY2010, our Scientific User Facilities delivered 113,000 hours of run time, 2.5% more than had been planned.

Quantifying performance of the research component of the portfolio is tougher, but again can be done in some cases. The Bioenergy Research Centers, the model for our Innovation HUBs, are now in their third year of operation. Oak Ridge's BioEnergy Science Center just announced that its researchers have developed a microbe that could directly convert cellulose into isobutanol, and so making an improved biofuel from a broader range of feedstocks. This is a very good example of what the Hubs are expected to do – tackle problems ripe for the integration of discovery-oriented science with translational engineering research that can quickly lead to opportunities for commercialization.

With that, I thank you for your attention and would be pleased to answer any questions you might have.